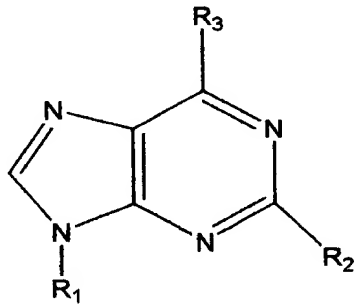
CLAIMS:

1. A method for inducing G-CSF secretion within the body of a subject, comprising administering to the subject an effective amount of an active ingredient selected from the group consisting of an adenosine A3 receptor agonist (A3RAg), an A1 adenosine receptor agonist (A1RAg) and a combination of an A3RAg and an A1RAg.

2. A method according to Claim 1, wherein said active ingredient is A3RAg.

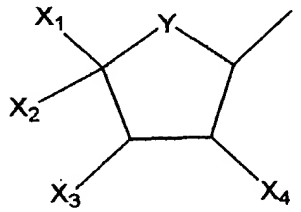
3. A method according to Claim 2, wherein the drug is administered orally.

4. method according to Claim 1, wherein said active ingredient is a nucleotide derivative of the following general formula (I):



(I)

wherein R_1 is C_1-C_{10} alkyl, C_1-C_{10} hydroxyalkyl, C_1-C_{10} carboxyalkyl or C_1-C_{10} cyanoalkyl or a group of the following general formula (II):



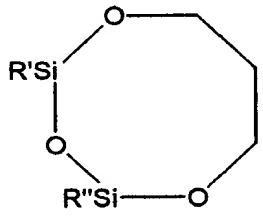
(II)

in which:

- Y is oxygen, sulfur of carbon atoms;
- X_1 is H, C_1-C_{10} alkyl, $R^aR^bNC(=O)$- or HOR^c-, wherein R^a and R^b may be the same or different and are selected from the group consisting of hydrogen, C_1-C_{10} alkyl, amino, C_1-C_{10} haloalkyl, C_1-C_{10} aminoalkyl, C_1-C_{10}

BOC-aminoalkyl, and C_3-C_{10} cycloalkyl or are joined together to form a heterocyclic ring containing two to five carbon atoms, and R^c is selected from the group consisting of C_1-C_{10} alkyl, amino, C_1-C_{10} haloalkyl, C_1-C_{10} aminoalkyl, C_1-C_{10} BOC-aminoalkyl, and C_3-C_{10} cycloalkyl;

- X_2 is H, hydroxyl, C_1-C_{10} alkylamino, C_1-C_{10} alkylamido or C_1-C_{10} hydroxyalkyl;
- X_3 and X_4 each independently are hydrogen, hydroxyl, amino, amido, azido, halo, alkyl, alkoxy, carboxy, nitrilo, nitro, trifluoro, aryl, alkaryl, thio, thioester, thioether, -OCOPh, -OC(=S)OPh or both X_3 and X_4 are oxygen connected to >C=S to form a 5-membered ring, or X_2 and X_3 form the ring of formula (III):



(III)

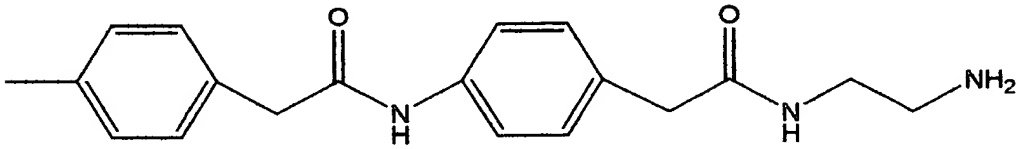
where R' and R" are independently C_1-C_{10} alkyl;

- R_2 is selected from the group consisting of hydrogen, halo, C_1-C_{10} alkylether, amino, hydrazido, C_1-C_{10} alkylamino, C_1-C_{10} alkoxy, C_1-C_{10} thioalkoxy, pyridylthio, C_2-C_{10} alkenyl; C_2-C_{10} alkynyl, thio, and C_1-C_{10} alkylthio; and

R_3 is a $-NR_4R_5$ group with R_4 being hydrogen or a group selected from alkyl, substituted alkyl or aryl-NH-C(Z)-, with Z being O, S, or NR^a with R^a having the above meanings,

- And R_5, where R_4 is hydrogen, is selected from the group consisting of R- and S-1-phenylethyl, benzyl, phenylethyl or anilide groups unsubstituted or substituted in one or more positions with a substituent selected from the group consisting of C_1-C_{10} alkyl, amino, halo, C_1-C_{10} haloalkyl, nitro, hydroxyl, acetoamido, C_1-C_{10} alkoxy, and sulfonic acid or a salt thereof; or R_4 is benzodioxanemethyl, fururyl, L-propylalanyl- aminobenzyl, β-

alanylamino- benzyl, T-BOC-β-alanylaminobenzyl, phenylamino, carbamoyl, phenoxy or C_1-C_{10} cycloalkyl; or R_5 is a group of the following formula:

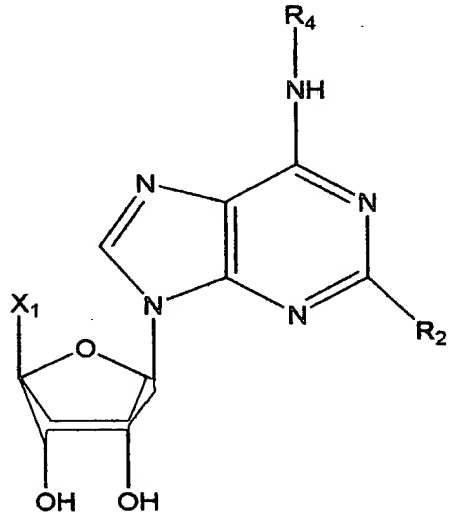


- or a suitable salt of the compound defined above, e.g. a triethylammonium salt thereof; or

when R_4 is, a group selected from alkyl, substituted alkyl, or aryl-NH-C(Z)-, then, R_4 is selected from the group consisting of substituted or unsubstituted heteroaryl-NR^a-C(Z)-, heteroaryl-C(Z)-, alkaryl-NR^a-C(Z)-, alkaryl-C(Z)-, aryl-NR-C(Z)- and aryl-C(Z)-;

wherein Z having the above defined meanings.

5. A method according to Claim 4, wherein said active ingredient is a nucleoside derivative of the general formula (IV):



(IV)

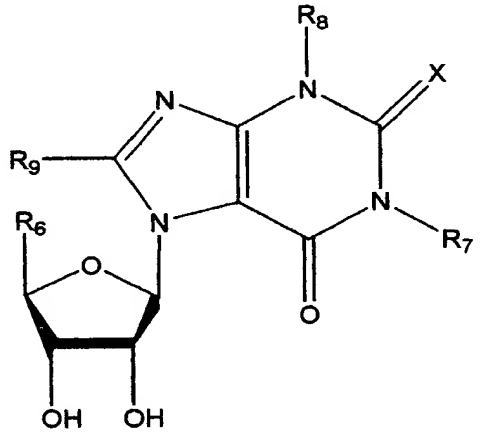
in which X_1, R_2 and R_4 are as defined in Claim 3.

6. A method according to Claim 5, wherein said active ingredient is an N6-benzyladenosine-5′-uronamide.

7. A method according to Claim 6, wherein said active ingredient is selected from the group consisting of N^6-2-(4-aminophenyl)ethyladenosine (APNEA), N^6-(4-amino-3- iodobenzyl) adenosine-5'-(N-methyluronamide) (AB-MECA) and 1-deoxy-1-{6- [({3-iodophenyl} methyl)amino]- 9H-purine-9-yl}-N-methyl- β-D-ribofuranuron-amide (IB-MECA) and 2-chloro-N^6-(2-iodobenzyl)-adenosine- 5′-N-methly-uronamide (Cl-IB-MECA).

8. A method according to Claim 1, wherein the active ingredient is N^6-benzyl-adenosine-5′-alkyluronamide-N^1-oxide or N^6-benzyladenosine-5′-N-dialyl-uron-amide-N^1oxide.

9. A method according to Claim 1, wherein the active ingredient is a xanthine-7-riboside derivative of the following general formula (VI):



(VI)

wherein:

- X is O or S;
- R_6 is $R^aR^bNC(=O)$- or HOR^c-, wherein
- R^a and ^{Rb} may be the same or different and are selected from the group consisting of hydrogen, C_1-C_{10} alkyl, amino, C_1-C_{10} haloalkyl, C_1-C_{10} aminoalkyl, and C_3-C_{10} cycloalkyl, or are joined together to form a heterocyclic ring containing two to five carbon atoms; and
- R^c is selected from C_1-C_{10} alkyl, amino, C_1-C_{10} haloalkyl, C_1-C_{10} aminoalkyl, C_1-C_{10} BOC-aminoalkyl and C_3-C_{10} cycloalkyl;

- R_7 and R_8 may be the same or different and are selected from the group consisting of C_1-C_{10} alkyl, C_1-C_{10} cycloalkyl, R- or S-1-phenylethyl, an unsubstituted benzyl or anilide group, and a phenylether of benzyl group substituted in one or more positions with a substituent selected from the group consisting of C_1-C_{10} alkyl, amino, halo, C_1-C_{10} haloalkyl, nitro, hydroxyl, acetamido, C_1-C_{10} alkoxy, and sulfonic acid;
- R_9 is selected from the group consisting of halo, benzyl, phenyl, C_3-C_{10} cyclalkyl, and C_1-C_{10} alkoxy;

or a salt of such a compound, for example, a triethylammonium salt thereof.

10. A method for therapeutic treatment, comprising administering to a subject in need an effective amount of an active ingredient for achieving a therapeutic effect, the therapeutic effect comprises induction of G-CSF production or secretion, and said active ingredient selected from the group consisting of an adenosine A3 receptor agonist (A3RAg), an A1 adenosine receptor agonist (A1RAg) and a combination of an A3RAg and an A1RAg.

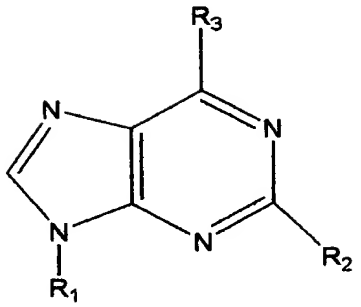
11. A method according to Claim 10, wherein said active ingredient is A3RAg.

12. A method according to Claim 11, wherein the drug is administered orally.

13. A method according to Claim 11, wherein said therapeutic effect is to counter drug-induced myelotoxicity.

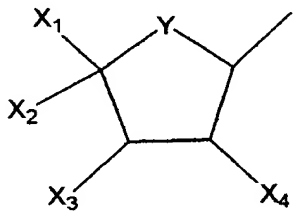
14. A method according to Claim 13, wherein said drug is a chemotherapeutic drug given to the subject within the framework of anti-cancer treatment.

15. A method according to Claim 11, wherein the active ingredient is a nucleotide derivative of the following general formula (I):



(I)

wherein R_1 is C_1-C_{10} alkyl, C_1-C_{10} hydroxyalkyl, C_1-C_{10} carboxyalkyl or C_1-C_{10} cyanoalkyl or a group of the following general formula (II):

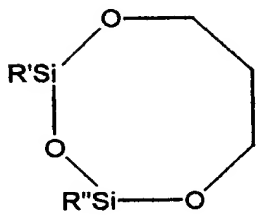


(II)

in which:

- Y is oxygen, sulfur of carbon atoms;
- X_1 is H, C_1-C_{10} alkyl, $R^aR^bNC(=O)$- or HOR^c-, wherein R^a and R^b may be the same or different and are selected from the group consisting of hydrogen, C_1-C_{10} alkyl, amino, C_1-C_{10} haloalkyl, C_1-C_{10} aminoalkyl, C_1-C_{10} BOC-aminoalkyl, and C_3-C_{10} cycloalkyl or are joined together to form a heterocyclic ring containing two to five carbon atoms, and R^c is selected from the group consisting of C_1-C_{10} alkyl, amino, C_1-C_{10} haloalkyl, C_1-C_{10} aminoalkyl, C_1-C_{10} BOC-aminoalkyl, and C_3-C_{10} cycloalkyl;
- X_2 is H, hydroxyl, C_1-C_{10} alkylamino, C_1-C_{10} alkylamido or C_1-C_{10} hydroxyalkyl;
- X_3 and X_4 each independently are hydrogen, hydroxyl, amino, amido, azido, halo, alkyl, alkoxy, carboxy, nitrilo, nitro, trifluoro, aryl, alkaryl, thio, thioester, thioether, -OCOPh, -OC(=S)OPh or both X_3 and X_4 are oxygen

connected to >C=S to form a 5-membered ring, or X_2 and X_3 form the ring of formula (III):



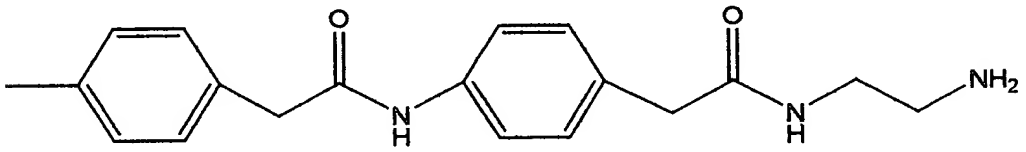
(III)

where R' and R" are independently C_1-C_{10} alkyl;

- R_2 is selected from the group consisting of hydrogen, halo, C_1-C_{10} alkylether, amino, hydrazido, C_1-C_{10} alkylamino, C_1-C_{10} alkoxy, C_1-C_{10} thioalkoxy, pyridylthio, C_2-C_{10} alkenyl; C_2-C_{10} alkynyl, thio, and C_1-C_{10} alkylthio; and

R_3 is a $-NR_4R_5$ group with R_4 being hydrogen or a group selected from alkyl, substituted alkyl or aryl-NH-C(Z)-, with Z being O, S, or NR^a with R^a having the above meanings,

- And R_5, where R_4 is hydrogen, is selected from the group consisting of R- and S-1-phenylethyl, benzyl, phenylethyl or anilide groups unsubstituted or substituted in one or more positions with a substituent selected from the group consisting of C_1-C_{10} alkyl, amino, halo, C_1-C_{10} haloalkyl, nitro, hydroxyl, acetoamido, C_1-C_{10} alkoxy, and sulfonic acid or a salt thereof; or R_4 is benzodioxanemethyl, fururyl, L-propylalanyl- aminobenzyl, β-alanylamino- benzyl, T-BOC-β-alanylaminobenzyl, phenylamino, carbamoyl, phenoxy or C_1-C_{10} cycloalkyl; or R_5 is a group of the following formula:

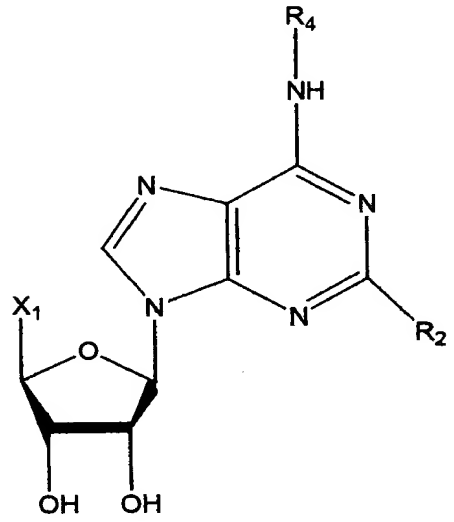


- or a suitable salt of the compound defined above; or

when R_4 is, a group selected from alkyl, substituted alkyl, or aryl-NH-C(Z)-, then, R_4 is selected from the group consisting of substituted or unsubstituted heteroaryl-NR^a-C(Z)-, heteroaryl-C(Z)-, alkaryl-NR^a-C(Z)-, alkaryl-C(Z)-, aryl-NR-C(Z)- and aryl-C(Z)-;

wherein Z having the above defined meanings.

16. A method according to Claim 15, wherein said active ingredient is a nucleoside derivative of the general formula (IV):



(IV)

in which X_1, R_2 and R_4 are as defined in Claim 15.

17. A method according to Claim 16, wherein said active ingredient is an N6-benzyladenosine-5′-uronamide.

18. A method according to Claim 17, wherein said active ingredient is selected from the group consisting of N^6-2-(4-aminophenyl)ethyladenosine (APNEA), N^6-(4-amino-3- iodobenzyl) adenosine-5'-(N-methyluronamide) (AB-MECA) and 1-deoxy-1-{6- [({3-iodophenyl} methyl)amino]- 9H-purine-9-yl}-N-methyl- β-D-ribofuranuron-amide (IB-MECA) and 2-chloro-N^6-(2-iodobenzyl)-adenosine- 5′-N-methly-uronamide (Cl-IB-MECA).

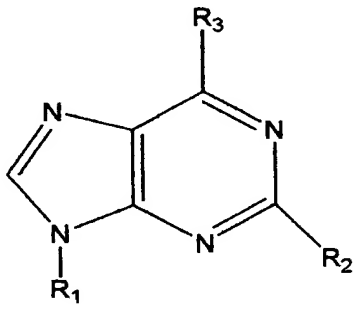
19. A method for inducing proliferation or differentiation of bone marrow or white blood cells in a subject, comprising administering to the subject an effective

amount of an active ingredient selected from the group consisting of an adenosine A3 receptor agonist (A3RAg), an adenosine A2RAn and a combination of an A3RAg or an A2RAn.

20. A method according to Claim 16, wherein said active ingredient is A3RAg.

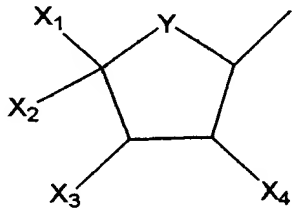
21. A method according to Claim 17, wherein the drug is administered orally.

22. A method according to Claim 19, wherein the active ingredient is a nucleotide derivative of the following general formula (I):



(I)

wherein R_1 is C_1-C_{10} alkyl, C_1-C_{10} hydroxyalkyl, C_1-C_{10} carboxyalkyl or C_1-C_{10} cyanoalkyl or a group of the following general formula (II):



(II)

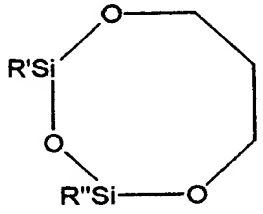
in which:

- Y is oxygen, sulfur of carbon atoms;
- X_1 is H, C_1-C_{10} alkyl, $R^aR^bNC(=O)$- or HOR^c-, wherein R^a and R^b may be the same or different and are selected from the group consisting of hydrogen, C_1-C_{10} alkyl, amino, C_1-C_{10} haloalkyl, C_1-C_{10} aminoalkyl, C_1-C_{10} BOC-aminoalkyl, and C_3-C_{10} cycloalkyl or are joined together to form a heterocyclic ring containing two to five carbon atoms, and R^c is selected from

the group consisting of C_1-C_{10} alkyl, amino, C_1-C_{10} haloalkyl, C_1-C_{10} aminoalkyl, C_1-C_{10} BOC-aminoalkyl, and C_3-C_{10} cycloalkyl;

- X_2 is H, hydroxyl, C_1-C_{10} alkylamino, C_1-C_{10} alkylamido or C_1-C_{10} hydroxyalkyl;

- X_3 and X_4 each independently are hydrogen, hydroxyl, amino, amido, azido, halo, alkyl, alkoxy, carboxy, nitrilo, nitro, trifluoro, aryl, alkaryl, thio, thioester, thioether, -OCOPh, -OC(=S)OPh or both X_3 and X_4 are oxygen connected to >C=S to form a 5-membered ring, or X_2 and X_3 form the ring of formula (III):



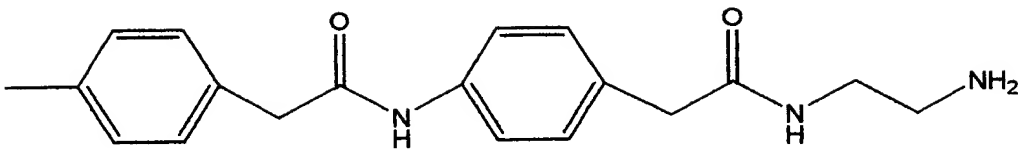
(III)

where R' and R" are independently C_1-C_{10} alkyl;

- R_2 is selected from the group consisting of hydrogen, halo, C_1-C_{10} alkylether, amino, hydrazido, C_1-C_{10} alkylamino, C_1-C_{10} alkoxy, C_1-C_{10} thioalkoxy, pyridylthio, C_2-C_{10} alkenyl; C_2-C_{10} alkynyl, thio, and C_1-C_{10} alkylthio; and

R_3 is a $-NR_4R_5$ group with R_4 being hydrogen or a group selected from alkyl, substituted alkyl or aryl-NH-C(Z)-, with Z being O, S, or NR^a with R^a having the above meanings,

- And R_5, where R_4 is hydrogen, is selected from the group consisting of R- and S-1-phenylethyl, benzyl, phenylethyl or anilide groups unsubstituted or substituted in one or more positions with a substituent selected from the group consisting of C_1-C_{10} alkyl, amino, halo, C_1-C_{10} haloalkyl, nitro, hydroxyl, acetoamido, C_1-C_{10} alkoxy, and sulfonic acid or a salt thereof; or R_4 is benzodioxanemethyl, furuyl, L-propylalanyl- aminobenzyl, β-alanylamino- benzyl, T-BOC-β-alanylaminobenzyl, phenylamino, carbamoyl, phenoxy or C_1-C_{10} cycloalkyl; or R_5 is a group of the following formula:

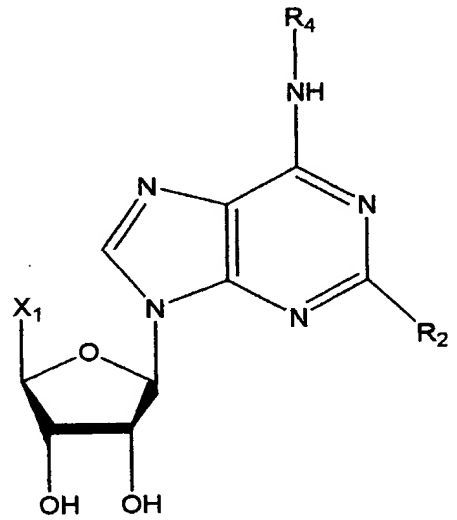


- or a suitable salt of the compound defined above; or

when R_4 is, a group selected from alkyl, substituted alkyl, or aryl-NH-C(Z)-, then, R_4 is selected from the group consisting of substituted or unsubstituted heteroaryl-NR^a-C(Z)-, heteroaryl-C(Z)-, alkaryl-NR^a-C(Z)-, alkaryl-C(Z)-, aryl-NR-C(Z)- and aryl-C(Z)-;

wherein Z having the above defined meanings.

23. A method according to Claim 19, wherein said active ingredient is a nucleoside derivative of the general formula (IV):



(IV)

in which X_1, R_1, and R_4 are as defined in Claim 19.

24. A method according to Claim 23, wherein said active ingredient is an N6-benzyladenosine-5′-uronamide.

25. A method according to Claim 24, wherein said active ingredient is selected from the group consisting of N^6-2-(4-aminophenyl)ethyladenosine (APNEA), N^6-(4-

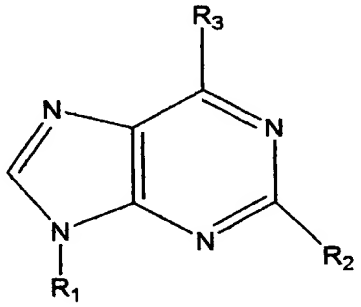
amino-3- iodobenzyl) adenosine-5'-(N-methyluronamide) (AB-MECA) and 1-deoxy-1-{6- [({3-iodophenyl} methyl)amino]- 9H-purine-9-yl}-N-methyl- β-D-ribofuranuron-amide (IB-MECA) and 2-chloro-N^6-(2-iodobenzyl)-adenosine- 5′-N-methly-uronamide (Cl-IB-MECA).

26. A method for prevention or treatment of leukopenia, comprising administering to a subject in need an effective amount of an active ingredient selected from the group consisting of an adenosine A3 receptor agonist (A3RAg), an A2RAn and a combination of an A3RAg or an A2RAn.

27. A method according to Claim 20, for prevention or treatment of drug- induced leukopenia.

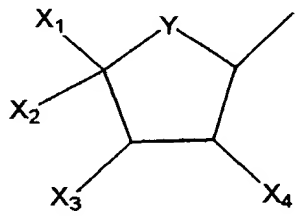
28. A method according to Claim 26, wherein said active ingredient is an A3RAg.

29. A method according to Claim 28, wherein the active ingredient is a nucleotide derivative of the following general formula (I):



(I)

wherein R_1 is C_1-C_{10} alkyl, C_1-C_{10} hydroxyalkyl, C_1-C_{10} carboxyalkyl or C_1-C_{10} cyanoalkyl or a group of the following general formula (II):

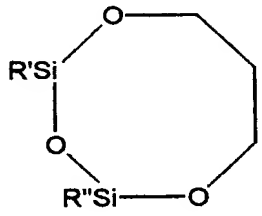


(II)

in which:

- Y is oxygen, sulfur of carbon atoms;

- X_1 is H, C_1-C_{10} alkyl, $R^aR^bNC(=O)$- or HOR^c-, wherein R^a and R^b may be the same or different and are selected from the group consisting of hydrogen, C_1-C_{10} alkyl, amino, C_1-C_{10} haloalkyl, C_1-C_{10} aminoalkyl, C_1-C_{10} BOC-aminoalkyl, and C_3-C_{10} cycloalkyl or are joined together to form a heterocyclic ring containing two to five carbon atoms, and R^c is selected from the group consisting of C_1-C_{10} alkyl, amino, C_1-C_{10} haloalkyl, C_1-C_{10} aminoalkyl, C_1-C_{10} BOC-aminoalkyl, and C_3-C_{10} cycloalkyl;
- X_2 is H, hydroxyl, C_1-C_{10} alkylamino, C_1-C_{10} alkylamido or C_1-C_{10} hydroxyalkyl;
- X_3 and X_4 each independently are hydrogen, hydroxyl, amino, amido, azido, halo, alkyl, alkoxy, carboxy, nitrilo, nitro, trifluoro, aryl, alkaryl, thio, thioester, thioether, -OCOPh, -OC(=S)OPh or both X_3 and X_4 are oxygen connected to >C=S to form a 5-membered ring, or X_2 and X_3 form the ring of formula (III):



(III)

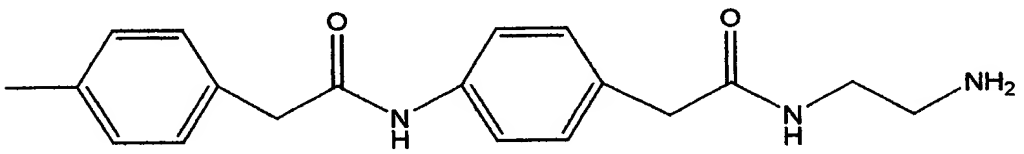
where R' and R" are independently C_1-C_{10} alkyl;

- R_2 is selected from the group consisting of hydrogen, halo, C_1-C_{10} alkylether, amino, hydrazido, C_1-C_{10} alkylamino, C_1-C_{10} alkoxy, C_1-C_{10} thioalkoxy, pyridylthio, C_2-C_{10} alkenyl; C_2-C_{10} alkynyl, thio, and C_1-C_{10} alkylthio; and

R_3 is a $-NR_4R_5$ group with R_4 being hydrogen or a group selected from alkyl, substituted alkyl or aryl-NH-C(Z)-, with Z being O, S, or NR^a with R^a having the above meanings,

- And R_5, where R_4 is hydrogen, is selected from the group consisting of R- and S-1-phenylethyl, benzyl, phenylethyl or anilide groups unsubstituted or substituted in one or more positions with a substituent selected from the

group consisting of C_1-C_{10} alkyl, amino, halo, C_1-C_{10} haloalkyl, nitro, hydroxyl, acetoamido, C_1-C_{10} alkoxy, and sulfonic acid or a salt thereof; or R_4 is benzodioxanemethyl, fururyl, L-propylalanyl- aminobenzyl, β-alanylamino- benzyl, T-BOC-β-alanylaminobenzyl, phenylamino, carbamoyl, phenoxy or C_1-C_{10} cycloalkyl; or R_5 is a group of the following formula:

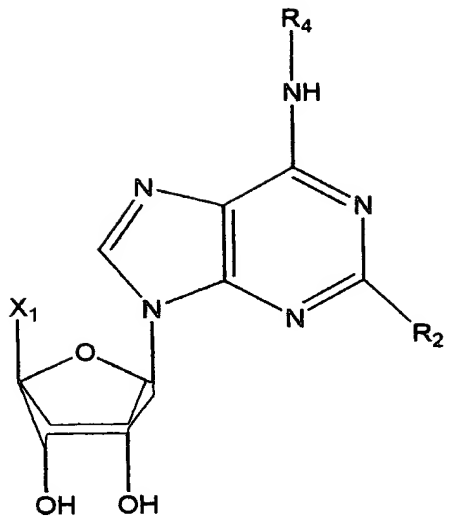


- or a suitable salt of the compound defined above, e.g. a triethylammonium salt thereof; or

when R_4 is, a group selected from alkyl, substituted alkyl, or aryl-NH-C(Z)-, then, R_4 is selected from the group consisting of substituted or unsubstituted heteroaryl-NR^a-C(Z)-, heteroaryl-C(Z)-, alkaryl-NR^a-C(Z)-, alkaryl-C(Z)-, aryl-NR-C(Z)- and aryl-C(Z)-;

wherein Z having the above defined meanings.

30. A method according to Claim 29, wherein said active ingredient is a nucleoside derivative of the general formula (IV):



(IV)

in which X_1, R_2 and R_4 are as defined in Claim 28.

31. A method according to Claim 30, wherein said active ingredient is an N6-benzyladenosine-5′-uronamide.

32. A method according to Claim 31, wherein said active ingredient is selected from the group consisting of N^6-2-(4-aminophenyl)ethyladenosine (APNEA), N^6-(4-amino-3- iodobenzyl) adenosine-5'-(N-methyluronamide) (AB-MECA) and 1-deoxy-1-{6- [({3-iodophenyl} methyl)amino]- 9H-purine-9-yl}-N-methyl- β-D-ribofuranuron-amide (IB-MECA) and 2-chloro-N^6-(2-iodobenzyl)-adenosine- 5′-N-methly-uronamide (Cl-IB-MECA).

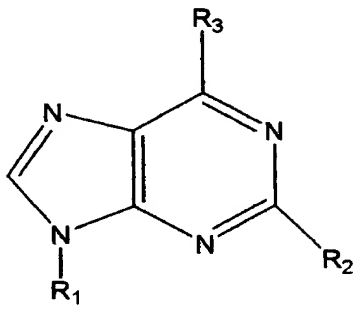
33. A method for prevention or treatment of toxic side effects of a drug, comprising administering to a subject in need an effective amount of an active ingredient selected from the group consisting of an adenosine A3 receptor agonist (A3RAg), an adenosine A2 receptor antagonists (A2Ran) and a combination of an A3RAg and an A2RAn.

34. A method according to Claim 33, wherein the toxic side effect is manifested by weight loss.

35. A method according to Claim 33, wherein said drug is a chemotherapeutic drug.

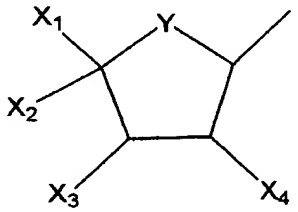
36. A method according to Claim 33, wherein said active ingredient is A3RAg.

37. A method according to Claim 36, wherein said active ingredient is a nucleotide derivative of the following general formula (I):



(I)

wherein R_1 is C_1-C_{10} alkyl, C_1-C_{10} hydroxyalkyl, C_1-C_{10} carboxyalkyl or C_1-C_{10} cyanoalkyl or a group of the following general formula (II):

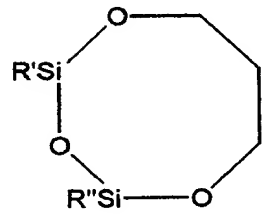


(II)

in which:

- Y is oxygen, sulfur of carbon atoms;
- X_1 is H, C_1-C_{10} alkyl, $R^aR^bNC(=O)$- or HOR^c-, wherein R^a and R^b may be the same or different and are selected from the group consisting of hydrogen, C_1-C_{10} alkyl, amino, C_1-C_{10} haloalkyl, C_1-C_{10} aminoalkyl, C_1-C_{10} BOC-aminoalkyl, and C_3-C_{10} cycloalkyl or are joined together to form a heterocyclic ring containing two to five carbon atoms, and R^c is selected from the group consisting of C_1-C_{10} alkyl, amino, C_1-C_{10} haloalkyl, C_1-C_{10} aminoalkyl, C_1-C_{10} BOC-aminoalkyl, and C_3-C_{10} cycloalkyl;
- X_2 is H, hydroxyl, C_1-C_{10} alkylamino, C_1-C_{10} alkylamido or C_1-C_{10} hydroxyalkyl;
- X_3 and X_4 each independently are hydrogen, hydroxyl, amino, amido, azido, halo, alkyl, alkoxy, carboxy, nitrilo, nitro, trifluoro, aryl, alkaryl, thio,

thioester, thioether, -OCOPh, -OC(=S)OPh or both X_3 and X_4 are oxygen connected to >C=S to form a 5-membered ring, or X_2 and X_3 form the ring of formula (III):



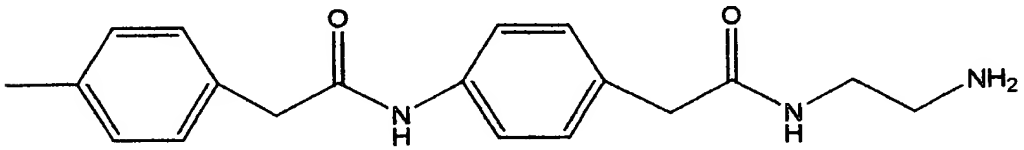
(III)

where R' and R" are independently C_1-C_{10} alkyl;

- R_2 is selected from the group consisting of hydrogen, halo, C_1-C_{10} alkylether, amino, hydrazido, C_1-C_{10} alkylamino, C_1-C_{10} alkoxy, C_1-C_{10} thioalkoxy, pyridylthio, C_2-C_{10} alkenyl; C_2-C_{10} alkynyl, thio, and C_1-C_{10} alkylthio; and

R_3 is a $-NR_4R_5$ group with R_4 being hydrogen or a group selected from alkyl, substituted alkyl or aryl-NH-C(Z)-, with Z being O, S, or NR^a with R^a having the above meanings,

- And R_5, where R_4 is hydrogen, is selected from the group consisting of R- and S-1-phenylethyl, benzyl, phenylethyl or anilide groups unsubstituted or substituted in one or more positions with a substituent selected from the group consisting of C_1-C_{10} alkyl, amino, halo, C_1-C_{10} haloalkyl, nitro, hydroxyl, acetoamido, C_1-C_{10} alkoxy, and sulfonic acid or a salt thereof; or R_4 is benzodioxanemethyl, fururyl, L-propylalanyl- aminobenzyl, β-alanylamino- benzyl, T-BOC-β-alanylaminobenzyl, phenylamino, carbamoyl, phenoxy or C_1-C_{10} cycloalkyl; or R_5 is a group of the following formula:

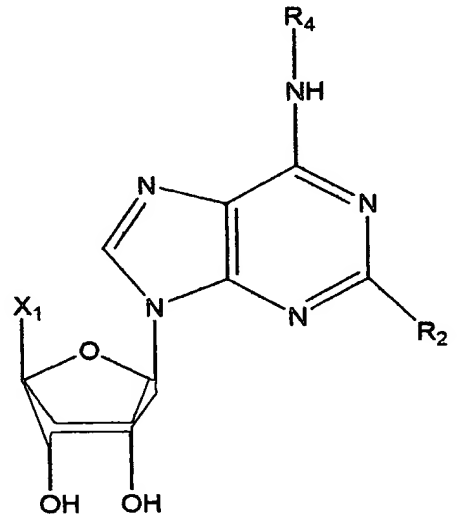


- or a suitable salt of the compound defined above, e.g. a triethylammonium salt thereof; or

when R_4 is, a group selected from alkyl, substituted alkyl, or aryl-NH-C(Z)-, then, R_4 is selected from the group consisting of substituted or unsubstituted heteroaryl-NR^a-C(Z)-, heteroaryl-C(Z)-, alkaryl-NR^a-C(Z)-, alkaryl-C(Z)-, aryl-NR-C(Z)- and aryl-C(Z)-;

wherein Z having the above defined meanings.

38. A method according to Claim 37, wherein said active ingredient is a nucleoside derivative of the general formula (IV):



(IV)

in which X_1, R_2 and R_4 are as defined in Claim 37.

39. A method according to Claim 38, wherein said active ingredient is an N6-benzyladenosine-5′-uronamide.

40. A method according to Claim 39, wherein said active ingredient is selected from the group consisting of N^6-2-(4-aminophenyl)ethyladenosine (APNEA), N^6-(4-amino-3- iodobenzyl) adenosine-5'-(N-methyluronamide) (AB-MECA) and 1-deoxy-1-{6- [({3-iodophenyl} methyl)amino]- 9H-purine-9-yl}-N-methyl- β-D-ribofuranuron-amide (IB-MECA) and 2-chloro-N^6-(2-iodobenzyl)-adenosine- 5′-N-methly-uronamide (Cl-IB-MECA).

41. A method for inhibiting abnormal cell growth in a subject, comprising administering to the subject a therapeutically effective amount of an active ingredient selected from the group consisting of an adenosine A3 receptor agonist (A3RAg), an adenosine A2 receptor agonist (A2RAg) and a combination of A3RAg and A2RAg.

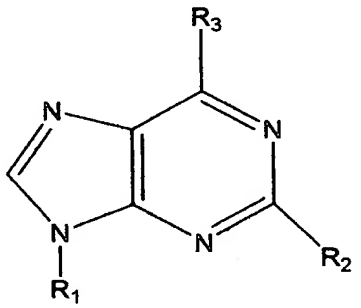
42. A method according to Claim 41, for inhibiting growth or proliferation of tumor cells.

43. A method according to Claim 41, wherein the active ingredient is an A3RAg.

44. A method according to Claim 43, wherein the drug is administered orally.

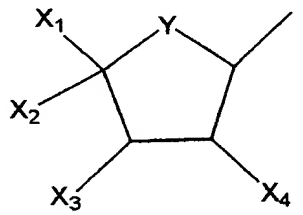
45. A method according to Claim 41, wherein the drug is administered in combination with a chemotherapeutic drug.

46. A method according to Claim 41, wherein the active ingredient is a nucleotide derivative of the following general formula (I):



(I)

wherein R_1 is C_1-C_{10} alkyl, C_1-C_{10} hydroxyalkyl, C_1-C_{10} carboxyalkyl or C_1-C_{10} cyanoalkyl or a group of the following general formula (II):

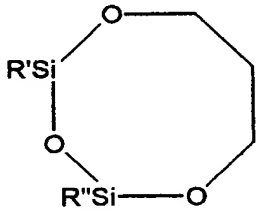


(II)

in which:

- Y is oxygen, sulfur of carbon atoms;

- X_1 is H, C_1-C_{10} alkyl, $R^aR^bNC(=O)$- or HOR^c-, wherein R^a and R^b may be the same or different and are selected from the group consisting of hydrogen, C_1-C_{10} alkyl, amino, C_1-C_{10} haloalkyl, C_1-C_{10} aminoalkyl, C_1-C_{10} BOC-aminoalkyl, and C_3-C_{10} cycloalkyl or are joined together to form a heterocyclic ring containing two to five carbon atoms, and R^c is selected from the group consisting of C_1-C_{10} alkyl, amino, C_1-C_{10} haloalkyl, C_1-C_{10} aminoalkyl, C_1-C_{10} BOC-aminoalkyl, and C_3-C_{10} cycloalkyl;
- X_2 is H, hydroxyl, C_1-C_{10} alkylamino, C_1-C_{10} alkylamido or C_1-C_{10} hydroxyalkyl;
- X_3 and X_4 each independently are hydrogen, hydroxyl, amino, amido, azido, halo, alkyl, alkoxy, carboxy, nitrilo, nitro, trifluoro, aryl, alkaryl, thio, thioester, thioether, -OCOPh, -OC(=S)OPh or both X_3 and X_4 are oxygen connected to >C=S to form a 5-membered ring, or X_2 and X_3 form the ring of formula (III):



(III)

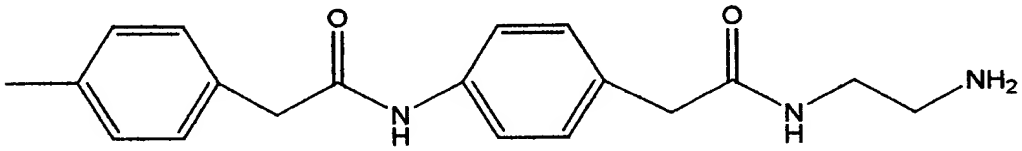
where R' and R" are independently C_1-C_{10} alkyl;

- R_2 is selected from the group consisting of hydrogen, halo, C_1-C_{10} alkylether, amino, hydrazido, C_1-C_{10} alkylamino, C_1-C_{10} alkoxy, C_1-C_{10} thioalkoxy, pyridylthio, C_2-C_{10} alkenyl; C_2-C_{10} alkynyl, thio, and C_1-C_{10} alkylthio; and

R_3 is a $-NR_4R_5$ group with R_4 being hydrogen or a group selected from alkyl, substituted alkyl or aryl-NH-C(Z)-, with Z being O, S, or NR^a with R^a having the above meanings,

- And R_5, where R_4 is hydrogen, is selected from the group consisting of R- and S-1-phenylethyl, benzyl, phenylethyl or anilide groups unsubstituted or substituted in one or more positions with a substituent selected from the

group consisting of C_1-C_{10} alkyl, amino, halo, C_1-C_{10} haloalkyl, nitro, hydroxyl, acetoamido, C_1-C_{10} alkoxy, and sulfonic acid or a salt thereof; or R_4 is benzodioxanemethyl, fururyl, L-propylalanyl- aminobenzyl, β-alanylamino- benzyl, T-BOC-β-alanylaminobenzyl, phenylamino, carbamoyl, phenoxy or C_1-C_{10} cycloalkyl; or R_5 is a group of the following formula:

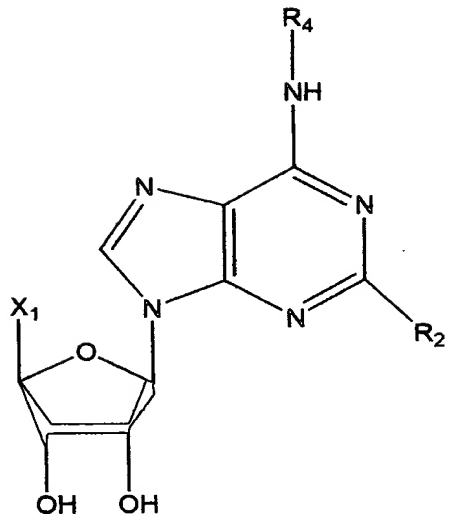


- or a suitable salt of the compound defined above, e.g. a triethylammonium salt thereof; or

when R_4 is, a group selected from alkyl, substituted alkyl, or aryl-NH-C(Z)-, then, R_4 is selected from the group consisting of substituted or unsubstituted heteroaryl-NR^a-C(Z)-, heteroaryl-C(Z)-, alkaryl-NR^a-C(Z)-, alkaryl-C(Z)-, aryl-NR-C(Z)- and aryl-C(Z)-;

wherein Z having the above defined meanings.

47. A method according to Claim 46, wherein said active ingredient is a nucleoside derivative of the general formula (IV):



(IV)

in which X_1, R_2 and R_4 are as defined in Claim 15.

48. A method according to Claim 47, wherein said active ingredient is an N6-benzyladenosine-5′-uronamide.

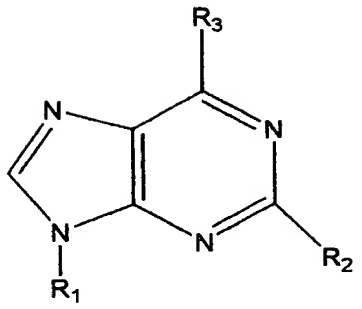
49. A method according to Claim 48, wherein said active ingredient is selected from the group consisting of N^6-2-(4-aminophenyl)ethyladenosine (APNEA), N^6-(4-amino-3- iodobenzyl) adenosine-5'-(N-methyluronamide) (AB-MECA) and 1-deoxy-1-{6- [({3-iodophenyl} methyl)amino]- 9H-purine-9-yl}-N-methyl- β-D-ribofuranuron-amide (IB-MECA) and 2-chloro-N^6-(2-iodobenzyl)-adenosine- 5′-N-methly-uronamide (Cl-IB-MECA).

50. A method for treating cancer in a subject, comprising administering to the subject an effective amount of an adenosine A3 receptor agonist (A3Rag), the administration of the A3RAg yielding a dual effect in both inhibiting proliferation of cancer cells and countering toxic side effects of chemotherapeutic drug treatment of the same subject.

51. A method according to Claim 50, wherein the A3Rag synergizes with said drug to yield a stronger anti-tumor effect.

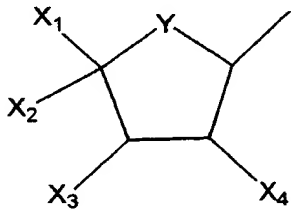
52. A method according to Claim 50, wherein the drug is administered orally.

53. A method according to Claim 50, wherein the active ingredient is a nucleotide derivative of the following general formula (I):



(I)

wherein R_1 is C_1-C_{10} alkyl, C_1-C_{10} hydroxyalkyl, C_1-C_{10} carboxyalkyl or C_1-C_{10} cyanoalkyl or a group of the following general formula (II):

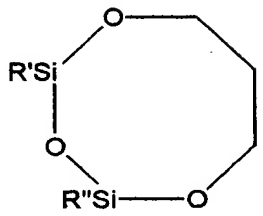


(II)

in which:

- Y is oxygen, sulfur of carbon atoms;
- X_1 is H, C_1-C_{10} alkyl, $R^aR^bNC(=O)$- or HOR^c-, wherein R^a and R^b may be the same or different and are selected from the group consisting of hydrogen, C_1-C_{10} alkyl, amino, C_1-C_{10} haloalkyl, C_1-C_{10} aminoalkyl, C_1-C_{10} BOC-aminoalkyl, and C_3-C_{10} cycloalkyl or are joined together to form a heterocyclic ring containing two to five carbon atoms, and R^c is selected from the group consisting of C_1-C_{10} alkyl, amino, C_1-C_{10} haloalkyl, C_1-C_{10} aminoalkyl, C_1-C_{10} BOC-aminoalkyl, and C_3-C_{10} cycloalkyl;
- X_2 is H, hydroxyl, C_1-C_{10} alkylamino, C_1-C_{10} alkylamido or C_1-C_{10} hydroxyalkyl;
- X_3 and X_4 each independently are hydrogen, hydroxyl, amino, amido, azido, halo, alkyl, alkoxy, carboxy, nitrilo, nitro, trifluoro, aryl, alkaryl, thio, thioester, thioether, -OCOPh, -OC(=S)OPh or both X_3 and X_4 are oxygen connected to >C=S

to form a 5-membered ring, or X_2 and X_3 form the ring of formula (III):



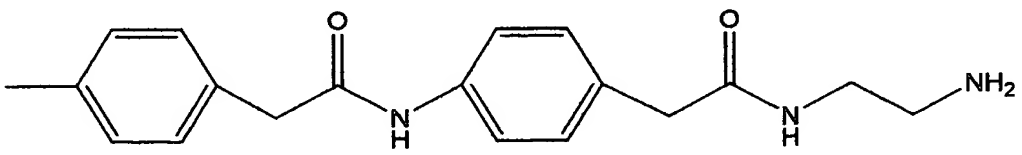
(III)

where R' and R" are independently C_1-C_{10} alkyl;

- R_2 is selected from the group consisting of hydrogen, halo, C_1-C_{10} alkylether, amino, hydrazido, C_1-C_{10} alkylamino, C_1-C_{10} alkoxy, C_1-C_{10} thioalkoxy, pyridylthio, C_2-C_{10} alkenyl; C_2-C_{10} alkynyl, thio, and C_1-C_{10} alkylthio; and

R_3 is a $-NR_4R_5$ group with R_4 being hydrogen or a group selected from alkyl, substituted alkyl or aryl-NH-C(Z)-, with Z being O, S, or NR^a with R^a having the above meanings,

- And R_5, where R_4 is hydrogen, is selected from the group consisting of R- and S-1-phenylethyl, benzyl, phenylethyl or anilide groups unsubstituted or substituted in one or more positions with a substituent selected from the group consisting of C_1-C_{10} alkyl, amino, halo, C_1-C_{10} haloalkyl, nitro, hydroxyl, acetoamido, C_1-C_{10} alkoxy, and sulfonic acid or a salt thereof; or R_4 is benzodioxanemethyl, fururyl, L-propylalanyl- aminobenzyl, β-alanylamino- benzyl, T-BOC-β-alanylaminobenzyl, phenylamino, carbamoyl, phenoxy or C_1-C_{10} cycloalkyl; or R_5 is a group of the following formula:

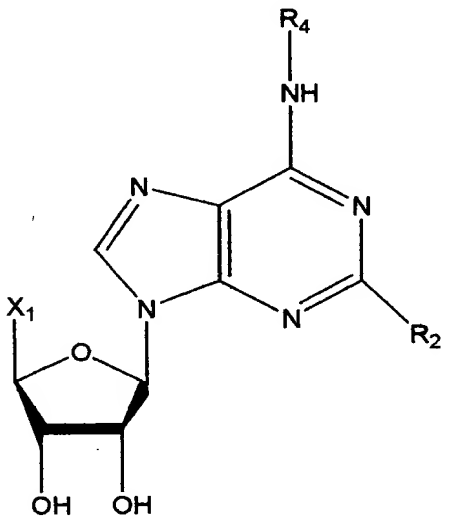


- or a suitable salt of the compound defined above, e.g. a triethylammonium salt thereof; or

when R_4 is, a group selected from alkyl, substituted alkyl, or aryl-NH-C(Z)-, then, R_4 is selected from the group consisting of substituted or unsubstituted heteroaryl-NR^a-C(Z)-, heteroaryl-C(Z)-, alkaryl-NR^a-C(Z)-, alkaryl-C(Z)-, aryl-NR-C(Z)- and aryl-C(Z)-;

wherein Z having the above defined meanings.

54. A method according to Claim 53, wherein said active ingredient is a nucleoside derivative of the general formula (IV):



(IV)

in which X_1, R_2 and R_4 are as defined in Claim 53.

55. A method according to Claim 54, wherein said active ingredient is an N6-benzyladenosine-5′-uronamide.

56. A method according to Claim 55, wherein said active ingredient is selected from the group consisting of N^6-2-(4-aminophenyl)ethyladenosine (APNEA), N^6-(4-amino-3- iodobenzyl) adenosine-5'-(N-methyluronamide) (AB-MECA) and 1-deoxy-1-{6- [({3-iodophenyl} methyl)amino]- 9H-purine-9-yl}-N-methyl- β-D-

ribofuranuron-amide (IB-MECA) and 2-chloro-N^6-(2-iodobenzyl)-adenosine- 5′-N-methly-uronamide (Cl-IB-MECA).